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Mission Training through Distributed Simulation – Contributing to Warfighter Integration

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INTRODUCTION

MTDS

Mission Training through Distributed Simulation (MTDS) is directed at training aircrew for combined air missions in a virtual environment. It has been the subject of NATO RTO activities over the past five years (Tomlinson, 2000, 2002). Currently, the combined task group SAS-034/MSG-001 is preparing exercise First WAVE (Warfighter Alliance in a Virtual Environment), to be held in 2004. Six nations plan to make available simulation assets and other resources to conduct a COMposite Air Operation (COMAO). The objectives are, among others, to demonstrate the potential of MTDS and to propose a plan for further implementation and exploitation of MTDS in NATO and the nations. In this paper, the MTDS concept is described, and the activities of NATO in this area are presented. The text then focuses on Exercise First WAVE and the Modelling and Simulation issues involved in this effort. The paper finishes with conclusions drawn over the past five years.

Distributed Simulation

The term "distributed simulation" can mean many things to many people. In the present context, distributed simulation is about using modern networking technology to join together a collection of compatible advanced real-time pilot-in-the-loop flight simulators, plus other simulations, located at separate sites, in order to create a shared virtual "battlespace" in which all components, including command and control elements such as AWACS, can conduct multinational operational training and mission rehearsal tasks.

This is illustrated in fig 1, which features a variety of aircraft types (mostly represented by simulators but some could be computer generated) from a range of NATO nations, linked together via communication networks such that each simulated aircraft flies in the same shared "battlespace". The aircraft and mission simulators need to be complemented by databases representing a shared geophysical environment, including weather, and a shared tactical environment representing threats as well as elements of own forces. This concept could be described as a "distributed training environment". A crucial feature is the provision of a Tactical Control Centre shown as an artist's impression in the centre of fig 1, from which the entire exercise is controlled and managed.

Paper presented at the RTO NMSG Conference on "NATO-PfP/Industry/National Modelling and Simulation Partnerships", held in Paris, France, 24-25 October 2002, and published in RTO-MP-094.

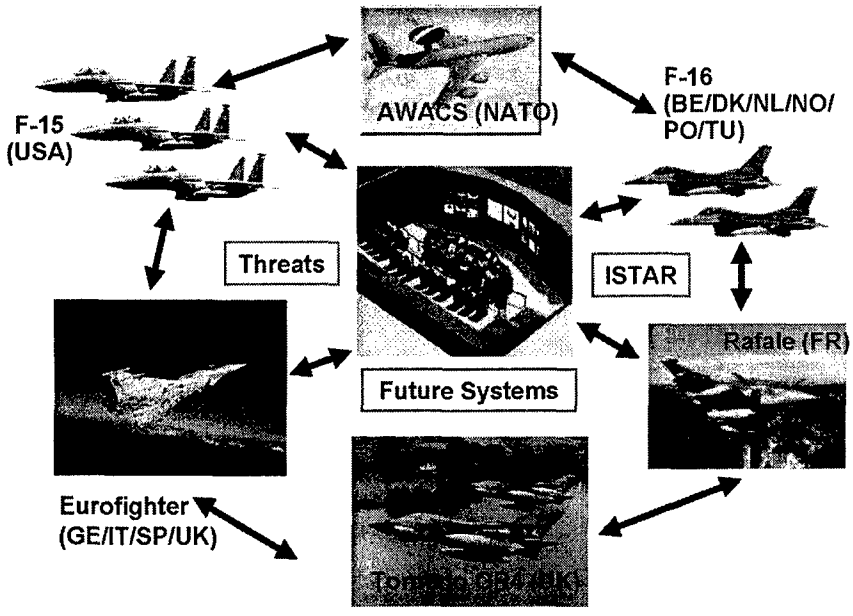

Figure 1: Distributed Training Environment.

Warfighter Integration

As concluded by the initial MTDS study (SAS-013) mentioned below, MTDS has great potential for NATO to enhance NATO's operational effectiveness to conduct composite air operations (COMAO). MTDS will contribute to integration of warfighters of different nations and with different roles in the operation. MTDS provides them with the opportunity to train together in a virtual environment. The environment is complementary to the sparse live flying occasions where NATO COMAOs can be trained. MTDS can provide a rich and complex operational environment and can expand the scope of training to include the chain of command, including real-time targeting and Command and Control. While training is the current aim, as the capabilities of the simulators evolve the networked simulators will gain the potential for mission rehearsal.

NATO BACKGROUND

Composite Air Operations

Air missions in a NATO context now focus extensively on operations where 20 to 40 or more aircraft fly in a package to strike a specific target or a set of targets. The composition of any package is based on the type of target, the expected threat during the mission and the level of destruction desired on the target.

Such a mission is referred to as a Composite Air Operation (COMAO). COMAOs are defined as "operations interrelated and/or limited in both time-scale and space, where units differing in type and/or role are put under the control of a single commander to achieve a common, specific objective" (AIRCENT manual 80-6 "Tactical Employment"). In this context, some typical roles are: Strike Attack, Air Defence, Offensive Support and Reconnaissance. Support roles include Airborne Early Warning, Electronic Warfare and Air-Air Refuelling.

A COMAO package will comprise aircraft in defined formations performing specified roles. A specific COMAO may also be referred to as a mission. Successful participation in a COMAO requires that

aircrews be prepared to participate as effective members of a multinational force. These aircrews must be trained to operate as part of a collective combined force involving two or more teams from two or more countries. To meet this requirement, aircrews must master the skills necessary not only to employ their individual weapons systems but they must also master a number of collective, or inter-team, skills involving communication, co-ordination, planning, decision making, and situation assessment that will be exercised in a complex multinational environment.

COMAO training focuses on collective skills. Collective training may be defined as "training involving two or more 'teams', where each team fulfils different 'roles', training (to interoperate) in an environment defined by a common set of training objectives". A typical COMAO package composition is given in Fig 2.

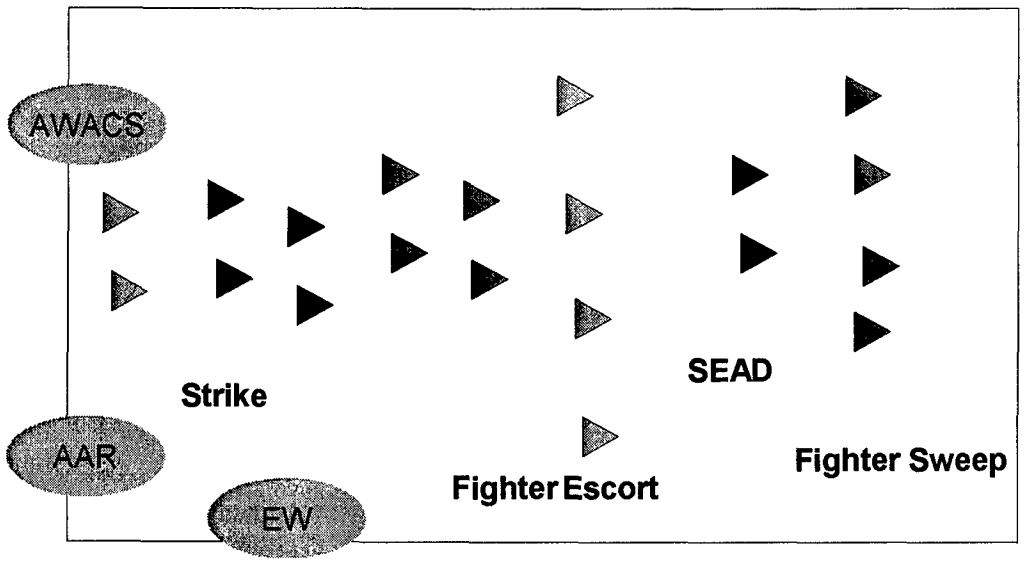

Figure 2: A Typical COMAO Package Composition.

A typical COMAO requires a lot of co-ordination and communication. Thus to achieve a successful outcome it is crucial that all participating aircrew adhere to the mission plan for the complete duration of the mission execution phase. However, not only the execution of the mission is important, also the process of Air Task Order (ATO) issue, mission planning, briefing and debriefing are essential elements in the training process for COMAOs.

NATO Training for COMAOs

NATO training for combined air operations is accomplished today through a variety of national programmes, including the US Red Flag and other exercises, and through the NATO Tactical Leadership Programme (TLP) based at Florennes, Belgium and also the annual NATO Air Meet (NAM) exercise. All these live flying exercises suffer from increasing constraints.

The Tactical Leadership Programme aims "to increase the effectiveness of allied tactical air forces through the development of leadership skills, tactical flying capabilities, mission planning and tasking capabilities, and conceptual and doctrinal initiatives". To do this, TLP provides integrated, multi-national flying and academic courses, seminars and conferences.

The impact of emerging and future systems is such that aircrew skills required to operate the next generation of aircraft are changing. The balance between flying skills and weapon system operation is now evolving to place greater emphasis on sensor manipulation, information management, situation awareness, decision making and communication. Such a change in emphasis generates a new training need for a complex tactical context in which sensor and weapon suites can be fully employed in association with other aircraft. Future operations will employ a "system of systems" in which single aircraft will themselves be part of an operational network. To ensure that aircrew will train as they will fight, they need opportunities to train with all appropriate and relevant assets.

NATO air forces need a virtual environment in which to acquire and sustain the skills needed to perform successfully as part of a multinational combined air force. This virtual environment needs to be inexpensive enough to be used frequently, be readily available at home station or some other appropriate location, and be secure enough to be used without revealing operational details and tactics to unauthorised personnel.

SAS-013 Study

The NATO RTO Military Applications Study SAS-013 was established by the Studies, Analysis and Simulation panel because a combination of factors is making it increasingly difficult to conduct adequate and effective aircrew training through live flying, especially training involving a variety of aircraft types and roles. The factors forcing change include lack of airspace and adequate range availability, environmental and safety restrictions, security constraints, concern about consumption of aircraft flying hours and airframe life, pressure to reduce training costs and limited opportunities to practise co-ordination of critical multinational NATO air missions in a representative operational environment, complete with threats. Furthermore, peace-time constraints typically preclude full operational use of Electronic Warfare (EW) systems, deployment of defensive aids such as chaff and flares and firing of live weapons. Modern weapon system performance capabilities and the growth of data links are also extending the "tactical reach" of an air package. Thus, aircrew combat training in the 2000-2010 time frame will need to be far different from the training of the 1990s, with emphasis on higher order weapons system employment skills requiring co-ordination, communication, and complex judgement.

The objective of the SAS-013 Study was "To assess the potential of advanced distributed simulation to complement live flying training in order to enhance NATO capability to conduct combined air operations", strong emphasis being placed on understanding the NATO operational environment and on how NATO training for combined air operations is accomplished today.

Placing mission training at the heart of the study emphasised that the study was not technology driven but focused on military need and preparation for operational capability. The study assumed that aircrew – pilots, navigators, and all weapons and mission system operators – participating in mission training for combined air operations possess the basic individual and team skills needed to be categorised as "combat ready". Such aircrew must then master the collective skills necessary in multinational operations as part of a larger unit involving two or more teams from two or more countries.

SAS-038 Symposium

A further RTO activity covering MTDS was the symposium (SAS-038) on "Air Mission Training Through Distributed Simulation (MTDS) – Achieving and Maintaining Readiness", held in April 2002 in Brussels. This NATO symposium aimed to enhance the NATO community's understanding of distributed simulation and its potential to enhance readiness training for NATO aircrews. Most NATO countries have ongoing research and acquisition programmes involving advanced distributed simulation. These programmes provide the foundation for a multinational training capability that will significantly enhance the readiness of NATO aircrews to conduct combined air operations. This Symposium brought

together military commanders, the military user, the training community and the simulation industry to participate in a forum for discussion of the military requirements for multinational aircrew mission training in NATO and of the potential application of advanced distributed simulation.

MTDS Task Group MSG-001/SAS-034

To make progress with MTDS in NATO, two task groups to develop and demonstrate the concepts of MTDS have been formed. These task groups (SAS-034 and MSG-001) are sponsored by the RTO Studies, Analysis and Simulation panel and by the NATO Modelling and Simulation Group. The principal aims are:

- to increase awareness amongst the NATO military community of the potential of MTDS
- to conduct a demonstration training exercise to show the potential benefits in NATO of multinational mission training through distributed simulation
- to establish a set of guidelines, procedures and standards based on the NATO Modelling and Simulation Action Plan
- to propose further actions needed to implement and exploit MTDS in NATO and the nations

The task groups are working jointly, and are referred to as the "MTDS task group" in the remainder of the paper.

The MTDS task group is composed of five different task teams. Each of these teams focuses on an aspect of the exercise:

- Operations and training
- Technical
- Security
- Assessment
- Awareness

A steering group heads the task group. The steering group is made up of the National representatives of the participating countries, the chairmen of SAS-034 and MSG-001 and the leaders of the task teams mentioned above. A full-time program manager, sponsored by the USA, manages the entire effort.

EXERCISE FIRST WAVE

Goals

The main effort of the MTDS task group is to set up and conduct Exercise First WAVE (Warfighter Alliance in a Virtual Environment). The exercise will be designed to fulfil the overall objectives of the MTDS task group as stated above. More specifically, the top-level aim of the exercise is to create a distributed simulation environment in which warfighters can conduct a Composite Air Operation in order to demonstrate and assess the potential of NATO MTDS. The environment will be designed and developed in accordance with the HLA Federation Development Process (FEDEP). Apart from the main objective to demonstrate and asses the training value of MTDS, Exercise First WAVE will be used to facilitate investigation into the three key areas Exercise Management, Interoperability (including security) and Computer Generated Forces.

The MTDS task group plans to conduct Exercise First WAVE in the first half of 2004. The exercise will have a duration of five days. At the time of writing this paper, the scenario and the implementation of the

Exercise federation are being developed. All participants have agreed on a User Requirements Document (URD). The information in this part of the paper is based on the URD. However, no definitive implementation plan has yet been established, and not all potential players have committed. Therefore, the description that follows may be subject to change as plans evolve.

Scenario

The scenario is based on a COMAO operation over a generic, Balkan-type area. Fighters in a sweep role will head the package. They will be followed by Suppression of Enemy Air Defence (SEAD) aircraft and fighter-bombers with embedded escort. Operational aircrew in virtual (man-in-the-loop) simulators will fulfil these blue force roles. Virtual fighters will also protect a blue AWACS and provide laser designation. A ground-based FAC will also be present in the scenario via a virtual simulator.

The scenario also includes a real-time targeting loop, planned as follows. At a moment in time, a virtual JSTARS notices movement of an enemy vehicle on the ground. Then a UAV is directed to the spot for reconnaissance and as the vehicle is classified as a threat to the COMAO package one or more of the fighter-bombers in the package is tasked by AWACS or CAOC to eliminate it.

Air Tasking Orders (ATOs), Air Co-ordination Orders (ACOs), Rules of Engagement (ROEs) and Special Instructions (SPINS) will be provided to ensure that the mission environment is as similar as possible to the operational environment. Also the development of a credible Intelligence Picture will be essential to fully immerse participating aircrew in the exercise scenario. The Intelligence Picture will explain the political developments that had led to the conflict and, amongst other considerations, will outline the Order of Battle (ORBAT) and the competency/morale of participating forces.

Participants

Participating nations are Canada, France, Italy, The Netherlands, the United Kingdom and the United States of America. Apart from the air forces in most of these nations, industry and Research and Technology Organisations participate in the preparations for Exercise First WAVE. These participants plan to commit different kinds of assets, personnel and technology to the exercise. Currently, this RTO activity relies entirely on voluntary contributions of the participants.

THE DISTRIBUTED TRAINING ENVIRONMENT

Introduction

The federation to be developed for Exercise First WAVE provides a virtual environment to train composite air operations. This environment uses simulation and exercise management assets present at geographically separated sites in multiple countries. These sites are connected via a Wide Area Network (WAN) to form a distributed training environment.

Key elements of this distributed training environment (DTE) are illustrated in Fig 3. As illustrated in the figure all these elements are directed at supporting the training objectives for a particular exercise. The separate elements of the DTE as shown in the figure are elaborated in the paragraphs below.

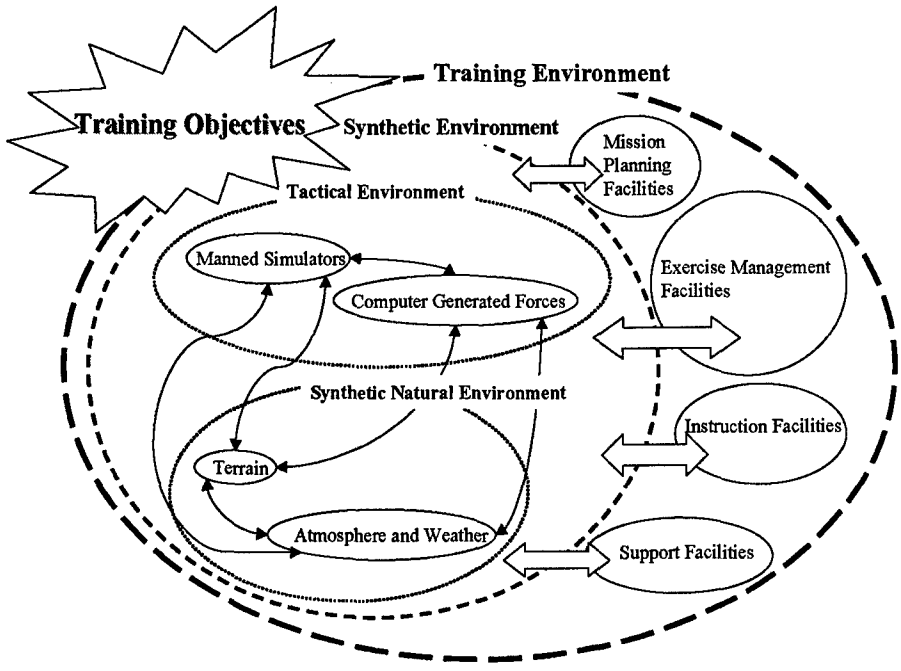

Figure 3: Elements of the Distributed Training Environment.

Training Objectives

As the exercise will be directed at training value, the federation will be developed to create a complete training environment. Not only the execution of the mission, but also the planning, briefing and debriefing will be facilitated. The high-level training objectives for the exercise will be:

- To practise daytime COMAO procedures employing fighter escort/sweep, AAR, SEAD, RECCE and AEW in a hostile environment
- To exercise procedures for defensive operations with Fighter Areas of Responsibility (FAORs) and point defence tasking
- To employ electronic warfare resources in support of offensive and defensive air operations
- To plan and integrate a multinational COMAO in a defined threat environment
- To brief a COMAO package generated from dispersed locations
- To conduct mission debriefs
- To engender efficient team-working skills between Nations and differing elements of the COMAO package
- To a develop a tactical appreciation of real-world threats
- To expose aircrew to situations to which they would not normally encounter in a peacetime environment
- To establish lessons identified

To the maximum extent possible, these training objectives will be used as a basis of assessing the training utility of the MTDS demonstration.

Synthetic Natural Environment

The Synthetic Natural Environment (SNE) represents the geophysical environment of the mission space, i.e. terrain and natural features, as well as 3D cultural features, together with the atmosphere and the weather. The SNE has to be represented well enough in the visual system and the sensors to serve the training objectives of the exercise, and to provide a maximum sense of immersion to the pilots.

The terrain database will consist of terrain elevation data and photo imagery. The goal is to have the entire playbox with at least five metre image resolution all over, with a 20-mile radius circle around the target area rendered with one metre resolution imagery. Located inside this 20-mile radius circle will be three desired target sets to be used in the MTDS exercise. The targets will be relevant to the type of scenario and will include ammunition and fuel depots, radar facilities, airfield installations etc, represented by 3D cultural features.

As the different participating simulations use various standards for visual and sensor databases, correlation of the databases becomes a significant issue. Producing a correlated SNE in the different formats is a task that requires a lot of effort. For Exercise First WAVE the SNE will be based on a database provided by Canada.

For training of time-critical targeting a mobile surface-to-air missile system will be included in the target set. At this point in time it does not seem feasible to integrate complex weather effects between all the participating simulators. For this reason, the weather will be no cloud and unlimited visibility.

Tactical Environment

The Tactical Environment defines the characteristics of, and performance for, all tactical entities which act on and react to each other and with the Synthetic Natural Environment.

The tactical environment will consist of manned (virtual) simulators and computer-generated forces. With some exceptions, the blue forces are manned simulators, and the red forces are CGF. The virtual simulators are a mix of operational simulators (currently used by aircrew for national training) and research simulators. Most CGFs will be generated by one central simulation package. An exception will be a few computer generated wingmen in the blue COMAO package, which will be simulated by the software integrated with the manned simulators to which they are attached. The red forces include air and ground threats. They will be programmed in such a way that they both support the training objectives and act realistically. Apart from these CGFs, the red force will have two manned fighter simulators.

Trigger events will be injected into the scenario during mission execution. These events are intended to provoke blue force interactions and promote training in the area of mission critical or time critical targeting. Trigger events will be planned in advance.

Interactions and Sensors

Interactions and sensors are a fundamental element of the distributed training environment. They provide the mechanism that enables one entity to know about the existence and behaviour of another entity. Interactions exist between the different tactical entities, and between a tactical entity and the geophysical environment. Interactions can be defined in various categories. Exercise First WAVE will facilitate radar, IR and visual interactions, physical contacts and voice communication. Within some flights, datalinks between aircraft will be simulated. No datalinks between flights and to/from AWACS are planned to be simulated. These interactions are all embodied in models, meaning that an interaction cannot exist unless one or more models incorporate it and exchange information about it.

Interactions between simulations are defined in the Federation Object Model (FOM). The sensors and weapons of most aircraft will be used as-is in the participating simulators. As far as can be judged at this moment, weapons and sensors of the participating simulators are modelled adequately for participation in Exercise First WAVE.

Exercise Management, Instruction and Planning

Setting-up, controlling and using a network of simulations as a training tool is a significant activity. An exercise scenario that facilitates the training objectives has to be designed, implemented and tested. During the training period, the environment must allow the trainees to do all planning, briefing, execution and debriefing activities necessary to receive maximum benefit from the COMAO mission. The personnel that assures that the training process proceeds according to the requirements is often referred to as the white force.

The individual sites will be connected not only during the execution phase, but also during the planning, briefing and debriefing activities. For planning, the sites will use their organic planning facilities. Briefing will be facilitated using interconnected interactive whiteboards and voice, so that the mission commander can brief all crews at the same time. For debrief, a distributed playback system will be used. This allows the mission commander or the white force to do a synchronised playback on a Plan View Display, including all voice communications. In live exercises this has proven to be a very effective way to highlight the lessons to be learned by the participants of the COMAO. These facilities may be supplemented by a video connection.

Additional Support Functions

Additional functions to support the exercise will be provided. They include the ability to set up and monitor the exercise in a technical sense, such that no trainees or members of the training staff are confronted with technical issues that would not occur in a live exercise. Provisions for management of the network and of security will also be made.

Network

An obvious requirement for a distributed training environment is a need for a wide area network with sufficient bandwidth to support real-time man-in-the-loop simulation and all the data that needs to be shared.

The current plan is to make use of an ATM cloud infrastructure for interconnection of the sites in the different countries. A portal will provide access to the network. This rack of equipment contains, amongst other devices, routers and an encryption device. It also includes a computer with software to interface a common data exchange standard with the local standard of interoperability of the different sites. The portal interfaces with both HLA and DIS systems. A portal will be present at each site or as the central node within a country. Some countries will use national networks to connect the different sites to each other and to the portal.

Security and Releasibility

The exercise First WAVE will be classified. This implies that the participating sites will be accredited for the applicable classification level, and that all data exchange between the sites will be encrypted. Furthermore, a project agreement between the participating nations has to be put in place in order to be able to release classified data over the network.

No multi-level security system will be used. This implies that all data present in the simulations connected over the network has to be releasable to all participants. For most participants this will mean that an arrangement must be made that allows the crews to obtain enough training value and yet will not reveal nationally classified data, e.g. accurate weapon parameters.

Security procedures require considerable time to establish. Therefore, a sound security plan is one of the first products that has to be produced for any exercise including networked classified simulations.

Fair Play

One of the principal considerations in a networked exercise is that it should enable a fair fight chance to every participant. This issue must be addressed early in exercise development. It means that the outcome of an exercise should be primarily determined by the characteristics of the weapons systems and human behaviour (tactics), and not by limitations or artefacts in modelling and simulation systems. It does not mean that every participant should have equal capabilities, but rather that whatever the results would be in the real world, those results should be accurately reflected in the simulation.

It must be realised that the capabilities of each networked simulator will determine its role and degree of participation in an exercise. For example, if the simulation of a particular aircraft sensor is not according to the actual behaviour of that sensor, it may not be allowed to use it in the virtual environment. Another example is a limited field of view of a participating simulator.

OTHER INITIATIVES

As evidence of the growing interest in distributed simulation for mission training, the SAS-013 Study identified numerous examples of national initiatives relevant to MTDS, including training system procurements, research and demonstrations.

Procurements of a new generation of advanced aircrew training systems, with the potential to be part of a distributed simulation mission training exercise, are in progress in many nations. These include:

- In the USA, the USAF Distributed Mission Training (DMT) Programme for Air Combat Command, with F-15C 4-ship simulators installed at Eglin and Langley AFBs in 1999 (Olson, 2002), an E-3 MTC in 2001 and two F-16 MTC sites due in 2002 (Bills & Burkley, 2002). These constitute the first steps in achieving a vision of a "Joint Synthetic Battlespace" by 2010.
- In the UK, a new generation of fast jet mission simulators for the Tornado GR4 (RAF), and Eurofighter (RAF) and, for the helicopter force, the WAH64 Apache Longbow (Army) mission simulators and the Medium Support Helicopter (RAF) simulators. All of these training systems have the potential to be linked to a wide area network.
- In Canada, plans for the CF-18 Advanced Distributed Combat Training System, part of an Advanced Distributed Mission Simulation concept.
- In France, the Combat Training Centre (CTC) at Mont de Marsan (Gardes, 2002).
- In the Netherlands, Norway and Belgium, F-16 MLU Unit Level Trainers. These have the capability to operate in a network of four F-16s and a CGI station.
- Germany, Italy, Spain and the UK are procuring Aircrew Synthetic Training Aids (ASTAs) for the Eurofighter programme.

Such national assets as these are vital as core elements in a potential future NATO MTDS capability.

CONCLUSIONS

Conclusions drawn over the past five years of NATO activities in the field of MTDS include the following:

- Several nations use, implement or plan national Mission Training Centres of networked simulators to meet national training requirements.
- Combining these assets into a MTDS infrastructure has great potential to sustain and improve the capability of NATO to conduct Combined Air Operations when used in a manner complementary to live operations.
- Integration of dissimilar (legacy) simulators into a distributed training environment raises several interoperability issues, including:
  - Security and releasibilty: the training environment has to provide a good balance between maximum training value and national data release aims.
  - Synthetic Natural Environment: in particular correlated visual and sensor databases and weather representation are not easy to achieve over dissimilar legacy simulators.
  - Representation: the degree to which the simulator represents the capabilities of the real aircraft will influence the role that can be played in the mission.
- Exercise First WAVE is the first ever NATO effort to demonstrate and assess the training value of MTDS in air operations. The distributed training environment for Exercise First WAVE will support the mission planning, briefing, execution and debriefing activities of the trainees.
- The federation and the guidelines being developed for Exercise First WAVE will be a basis for further implementation and exploitation of MTDS within NATO.

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Mission Training through Distributed Simulation

Contributing to warfighter integration

Contents

- Introduction
- MTDS
- Exercise First WAVE
- Conclusions

MTDS

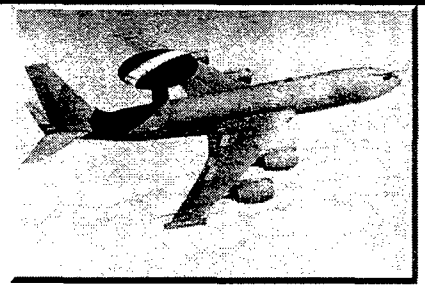
- Mission Training through Distributed Simulation
- Conduct air missions in networked simulators
- (Fast jet operations)
- Complementary to live missions
- Expedient due to
  - Changing air missions
  - Restrictions to live training missions
  - Improved simulation technology

Preliminary NATO RTO study (SAS-013)

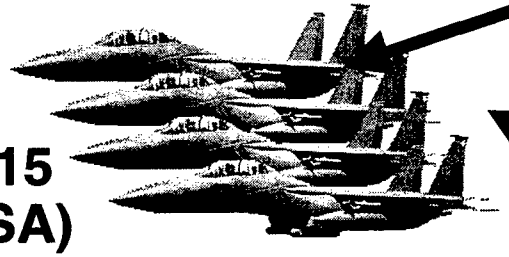
- MTDS has great potential for NATO
- To sustain and improve operational effectiveness for multinational air operations
- More focussed use of live flying training time
- Involve wider air operations community
- Mission rehearsal

- Initiate multinational demonstration

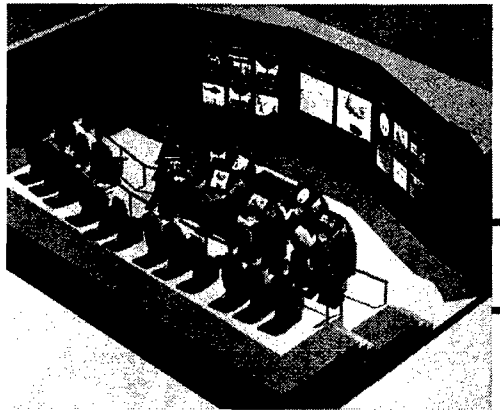
MTDS vision

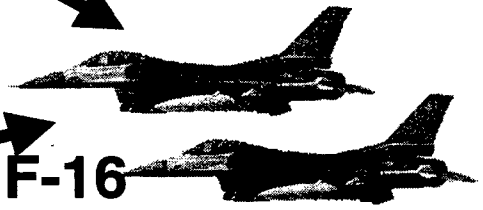


AWACS (NATO)



F-15 (USA)





F-16 (NL/BE/DK/NO/TU)

Threats

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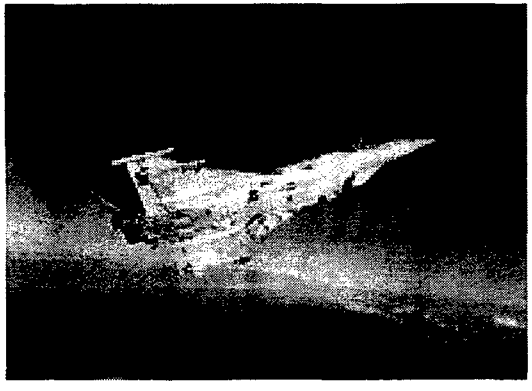


Future Systems

Tornado GR4 (UK)

Eurofighter (GE/IT/SP/UK)

Rafale (FR)

Current RTO task groups

- MSG-001 task group
  - "Distributed mission rehearsal for NATO combined air operations"
- SAS-034 task group
  - "MTDS concept development and demonstration"
- Combined into MTDS task group SAS-034/MSG-001

SAS-034/MSG-001 objectives

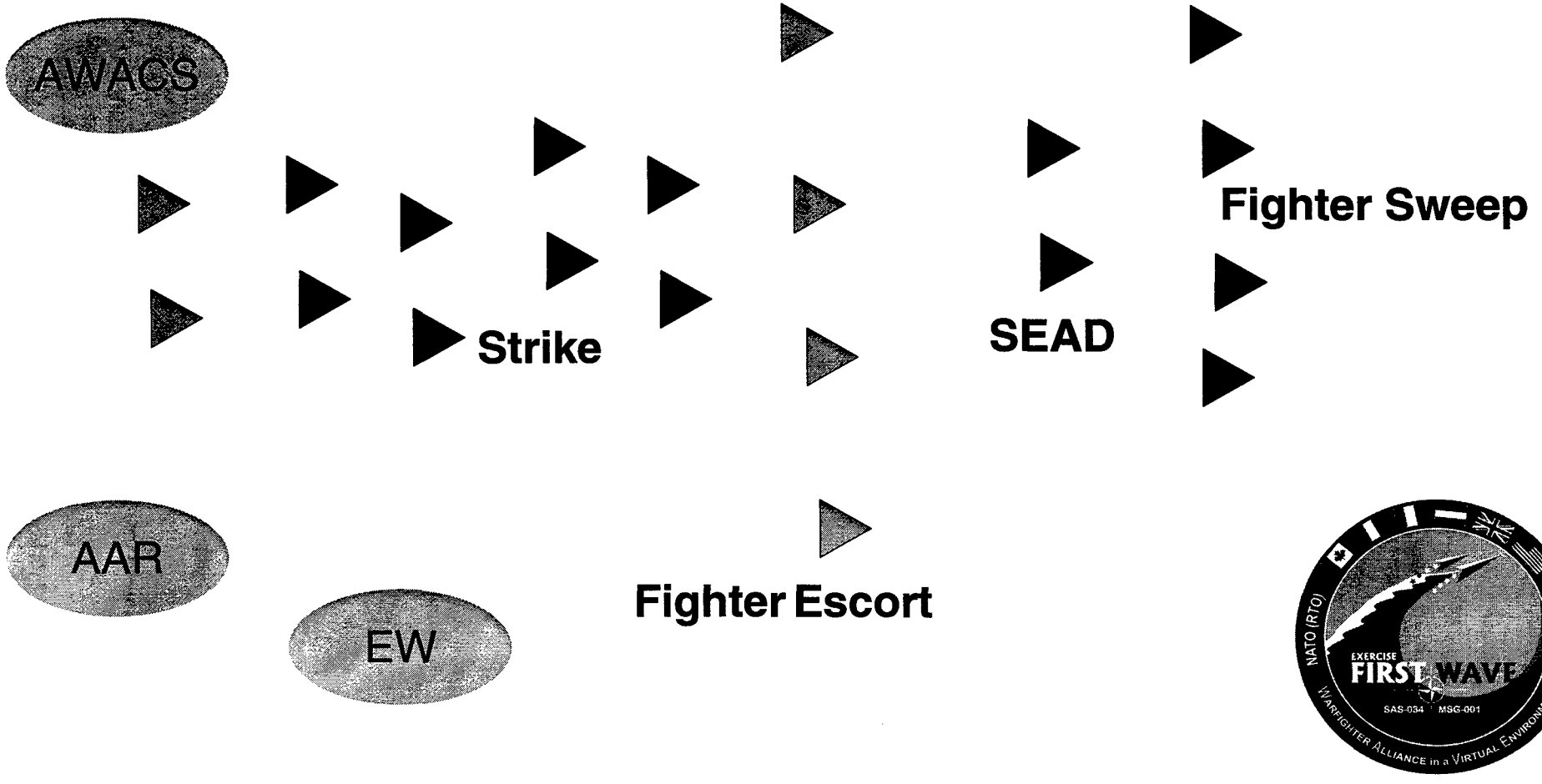
- Increase awareness of MTDS capabilities
- Demonstrate the potential of MTDS
- Establish guidelines, standards and procedures based on M&S action plan
- Propose a plan for implementation and exploitation of MTDS

Exercise First WAVE

- First Warfighter Alliance in a Virtual Environment
- Exercise to demonstrate training value
- Develop globally distributed federation
- Simulations and (de)briefing facilities on national sites
- Connected over Wide Area Network
- COMAO in virtual environment
- First half 2004

COMAO Example

Typical Package Composition



Scenario

- COMAO
- Red air
- High Value Airborne Asset protection
- Medium level
- Balkan area
- Includes direct targeting loop

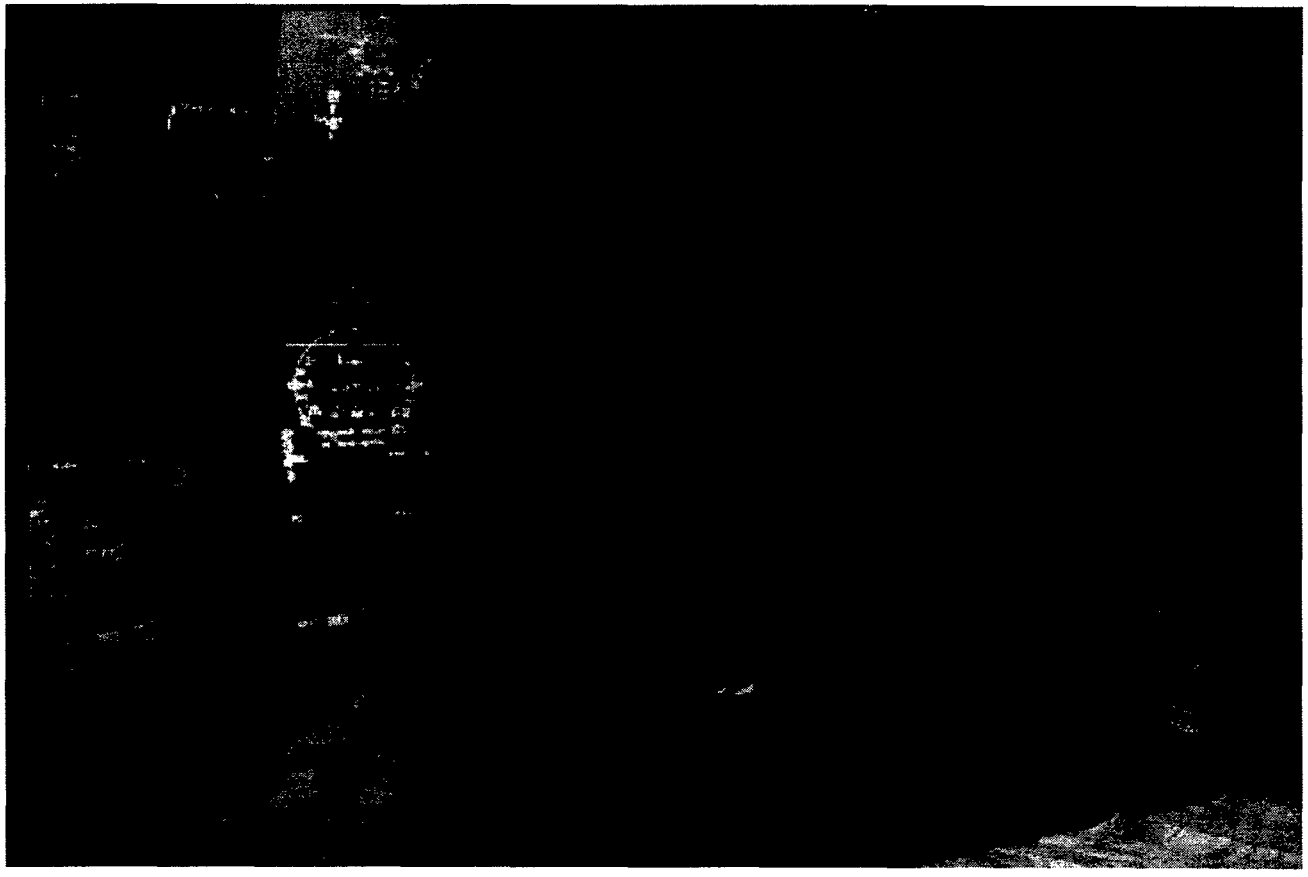
Simulation assets

- Fighters/ fighter bombers
  - F-15, F-16, F-18, GR4, Mirage 2000, Eurofighter
- C2 systems
  - CAOC, AWACS, FAC
- Sensor systems
  - JSTARS, UAV

Other assets

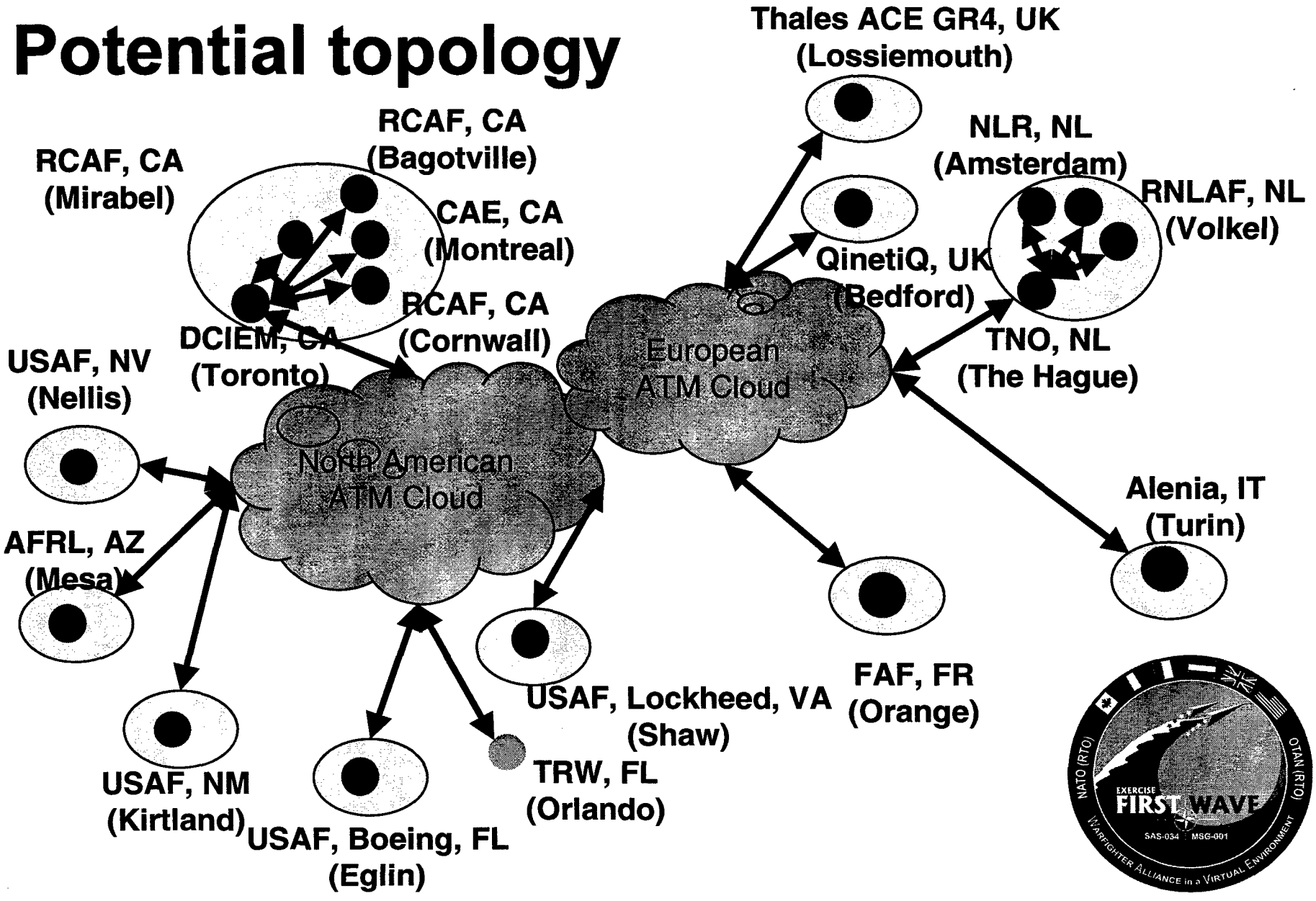
- Computer Generated Forces
- Exercise control centre (white force)
- Briefing and debriefing assets
- Databases
- Portals (including encryption)
- Networks

Debriefing



(USAF photo)

Potential topology



Participants

- Air Forces
- Industry
- Research and technology organisations

Participating nations and national programs

- CA: CF-18 Advanced Distributed Combat Training System
- FR: Mont de Marsan Centre d'Entraînement au Combat
- IT: Eurofighter Aircrew Synthetic Training Aids
- NL: Networked F-16 Unit Level Trainers
- UK: GR-4, Eurofighter Aircrew Synthetic Training Aids
- US: Distributed Mission Training

Partners

Alenia AERONAUTICA

THALES

TRW

CAE

PLEXSYS

TNO

QinetiQ

NLR

MÄK TECHNOLOGIES

BOEING®

LOCKHEED MARTIN

Task Group focus areas

- Operations and Training
- Technics
  - Networks
  - Visuals
  - FOM / DIS
  - Brief / debrief
- Security
- Assessment
- Awareness

Challenges

- Integrate dissimilar legacy simulations
  - Synthetic Natural Environment
  - Representation of aircraft capabilities
- Arrange releasibility of data
- Use FEDEP, document project
- Arrange funding
- Create complete training environment

Conclusions

- Nations plan to use networked simulators for air mission training
- Combined efforts in "Exercise First WAVE" have great potential for viable NATO training infrastructure
- Many challenges
- Strong partnership:
  NATO, Governments, Industry